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Editorial

Nominating Fellows

For the past 20 years, AGU has elected a few Members each year to the grade of Fellow in recognition of their outstanding contributions to the various branches of geophysics. The bylaws of AGU stipulate that only Members of AGU may be elected Fellows and that the number elected in a given year shall not exceed 0.1% of the then current membership of AGU. At present there are 379 Fellows.

For many years nominations for Fellowship have been requested from the membership at large. To encourage more active participation on the part of all sections of AGU as well as by those unaffiliated with any section, the Council (May 24, 1981) adopted the following procedure.

1. Nominations are to be sent to the Fellows Committee through the respective section presidents or through their designated committee.

2. Nominations of individuals unaffiliated with any section may be sent directly to the Fellows Committee.

3. Each section may submit at most three nominations to the Fellows Committee.

It is intended that the sections serve both as initial reviewers of the nominations and as an advocate for their selections. The Fellows Committee will maintain a list of past nominations but not of their supporting statements. Thus any previous nominations must be resubmitted as a new nomination.

By this procedure it is hoped that there will be a better sectional balance of nominations.

It appears that some sections have been much more active than others over the past 10 years in nominating and promoting the selection of their candidates. The fact that the Planetology and Solar-Planetary Relationships sections have large numbers of Fellows elected in recent years, when compared with the percentage of the total membership affiliation in those sections, may also reflect the pace of research in these areas. The number of Fellows elected during 1971-1981 is shown in Table 1 as is the percentage for primary section affiliation for the total membership. Between 1982 and 1971 it was AGU's practice to select automatically as AGU Fellows those members who were elected Fellows of the National Academy of Sciences and the National Academy of Engineering. An imbalance from the large initial selection of Fellows in 1982 resulted. One hundred twelve of these Fellows are still current members and

TABLE 1. Fellows as a Percentage of Affiliation

Section	Membership Affiliation By Section, percent	Fellows Elected By Section, 1971-1981, percent	Fellows Elected in 1982, percent
Geodesy	4	5	1
Geomagnetism and Paleomagnetism	5	6	5
Hydrology	17	8	6
Meteorology	8	11	6
Oceanography	13	9	11
Planetology	5	9	9
Solar-Planetary	10	11	10
Relationships	12	17	16
Tectonophysics	9	10	8
Volcanology			
Geochemistry, and Petrology	10	12	18
None	7	2	4

News

Space Telescope Leads a New Generation

The Space Telescope, approved for a space shuttle launch in 1985, will resolve visible and ultraviolet light orders of magnitude better than earth-based telescopes. Even though its aperture of 2.4 m will be less than half of the aperture of the reflector at Mt. Palomar, it is considered relatively large and immensely superior to existing orbiting telescopes. It is expected that the Space Telescope, with its freedom from thermal jitter and the hindrance of atmospheric absorption, will increase the user load on larger aperture earth-based telescopes, and construction of a new series of large telescopes is now in the planning stages. The National Academy of Sciences is expected to release shortly a report by its Astronomy Survey Committee, headed by George Field of the Harvard-Smithsonian Observatory, that will recommend building a 15-m optical-infrared 'National Telescope' [Phys. Today, August 1981, p. 17]. In addition, a 7.6-m single reflector is planned at the University of Texas, a 10-m segmented reflector is planned at the University of California, and the University of Arizona is experimenting with designs of a Multiple-Mirror Telescope (MMT) larger than their new 4.5 m (equivalent) MMT. All of these are larger than the Russian 6-m telescope, whose Pyrex reflector has not performed well, apparently because of gravitational sag and thermal inertial stresses.

Discussions of the planned Space Telescope [i.e., J. Bannell and C. O. Dell, The Space Telescope observatory, J. Astron. Sci., 28, 107, 1980] are mostly technical, the main objectives being new (unidentified) discoveries in space. Not only will the telescope be equipped with an array of high resolution and 'faint-object' spectrographs, photometer, and cameras, but instruments will be installed in space by astronaut-operators to accommodate new projects and for updating purposes. Every 5 years the observatory will be returned to earth for a refit.

The orbiting telescope will not make the earth-bound telescopes obsolete but will act as a forerunner for new discoveries in space. The high angle resolution range will be explored, and the accuracy of the spacecraft's fine guidance system will contribute greatly to the observations. It is pointed out that the smaller collecting area of the Space Telescope reflector is significantly slower than larger aperture earth telescopes (except for faint objects). Hurlan Smith, chairman of the Associated Universities for Research in Astronomy, has said that because the operational Space Telescope costs are a factor of 10 higher than earth-based telescopes, 'each photon in space will cost a hundred times more than those gathered on the ground' [Phys. Today, August 1981, p. 17].

The proposed new telescopes will depend on new technology to overcome problems arising from the large stresses on the high precision reflecting mirrors. Surfaces must not deform by more than 10^{-3} μ m over the 7- to 10-m diameter. New mounting techniques, new materials, and new weight-saving techniques will be used to conserve rigidity of the reflectors by avoiding some of the more objectionable sources of gravitational stress concentrations. Computers will be used for complex requirements of tracking and for matching alignment of multiple mirror systems. Special glasses and other materials will be employed to overcome thermal stresses. New lens grinding procedures using interferometric laser beams are more accurate than before, and it may be possible to obtain / slope configurations of an order of magnitude lower than those possible by previous methods. Fourth-order parabolic surfaces are difficult to grind, and several new techniques will be attempted.

Operation techniques of the new telescopes will be devised to take advantage of the gravitationally stable, low thermal-inertia surfaces. The multiple-mirror telescopes may use an oscillation technique to cancel the atmospheric jitter caused by clear-air turbulence. Images defined accurately by the space telescope may provide reference calibration for observations on the ground, and thus they can be used as continual references during a given observation.

The new era of telescopes will begin with the launching of the Space Telescope in 1985. The larger ground-based telescopes will probably not be in operation before 1990. The applications and goals, in addition to improving present observations, include obtaining new values for astronomical distances, searching for new planets outside of our solar

comprise 30% of the current Fellows. Although considerable improvement in the balance among sections has been achieved since that time, the problem has by no means been completely rectified. The fourth column shows the percentage of Fellows by section for those that became Fellows before 1983 and are still members.

Fellows' nominations must be made on forms available from AGU, 2000 Florida Avenue, N.W., Washington, D.C. 20009 (telephone: 202-462-6903 or toll free 800-424-2488).

The time schedule for the 1982 election of Fellows is as follows: October 1981, call for nominations now appearing in *Eos*; November 15, 1981, deadline for nominations to section presidents; January 15, 1982, deadline for nominations to Fellows Committee; April 15, 1982, deadline for citations; June 1, 1982 (tentative), honors ceremony in Philadelphia.

Nicholas C. Matalas
Chairman, Fellows Committee

New JGR-Blue Editor

As of October 1, 1981, all new manuscripts for the *Journal of Geophysical Research*, Blue, are to be sent to Bengt U. Ö. Sonnerup, Thayer School of Engineering, Dartmouth College, Hanover, NH 03755.

system, observing giant and supergiant stars, making new spectral measurements of quasars, studying interstellar matter, and measuring stellar brightness.—PMB

Ariane: NASA's European Rival

The successful test launch of two three-quarter ton satellites in the European Space Agency's (ESA) Ariane rocket last June firmly placed ESA in competition with NASA for the lucrative and growing satellite launching market. Under the auspices of the private (but largely French-government financed) ArianeSpace company, ESA is already attracting customers to its three-stage rocket by offering low costs.

According to recent reports [Nature, 292, pp. 785 and 788, 1981], ArianeSpace has been able to win several U.S. customers away from NASA, including Southern Pacific Communications, Western Union, RCA, Satellite Television Corporation, and GTE. Nature [292, 1981] magazine in an article entitled 'More Trouble for the Hapless Shuttle' suggests that it will be possible for Ariane to charge lower prices for a launch than NASA, even with the space shuttle.

It is noted that the shuttle is far behind schedule, and its near-future flights may be subjected to great demand for military projects. The costs of placing a three-quarter-ton satellite into geostationary orbit are about \$28 million by ESA with Ariane and about \$35 million by NASA with the Thor Delta rocket system. The analogous costs of the

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John F. Dewey, Editor-in-Chief



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Cover: Field lines in the Jovian magnetosphere (heavy lines) and contours of constant B magnitude (light lines) based on a model of Jupiter's azimuthal current disc. Currents flow in an equatorial annulus of width $5 R_J$, extending from $5 R_J$ (near the orbit of Io) to $50 R_J$, approximately 100 million amperes in all. (Figure from J. E. P. Connery, based on a model from his article in the special Voyager issue, *J. Geophys. Res.*, 86 (A10), 1981.)

Correction

Voyager advertisement, EOS 9/29/81, page 682 should read 'Voyager Missions to Jupiter.' See corrected ad this issue page 688.

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فَكَانَ مِنَ الْغَالِبِينَ

Petrologist Northern Illinois University. Applications are invited for a tenure track position in igneous or metamorphic petrology at the assistant or associate professor level beginning either January, 1982 or August, 1982. A Ph.D. degree is required and post-doctoral research experience is preferred. The successful candidate will be expected to pursue an active research program, teach at the undergraduate and graduate level, and direct Masters and Ph.D. graduate research work. Facilities housed within the Department of Geology include a fully automated electron microprobe, SEM, solid-source and gas-source mass spectrometers, AA, XRD, and XRF. To receive full consideration, please send resume, statement of research interests, and the names of three references, by November 1, 1981, to Jonathan H. Berg, Search Committee Chairman, Department of Geology, Northern Illinois University, DeKalb, Illinois, 60115. An equal opportunity/affirmative action employer.

Engineering Geologist/Geophysicist. The Department of Geological Sciences, University of Saskatchewan, has a vacant tenureable position in engineering geology/geophysics. Applicants should be qualified to teach undergraduate and graduate courses and to conduct research in engineering geology. A background in structural geology may be appropriate. Well-equipped facilities are available for research in rock mechanics, fluid flow through porous media, acoustic, and electrical properties of rocks, and permafrost. Good opportunities exist for joint research with qualifications and experience. Send applications, detailed personnel resume including the names of at least three referees, and other supporting data to Dr. W.G.E. Caldwell, Head, Department of Geological Sciences, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0.

Please note: until November 15, 1981 consideration will be given only to applicants who are Canadians or landed immigrants, after that date all applications will be considered.

Virginia Polytechnic Institute and State University: Senior Research Associate. Interesting and abundant research and publishing opportunities, including new instrumentation, MOS-10 VIBROSEIS system, VAX 11-780 computer. Must have experience in theory and application of reflection seismology, and be interested in the application of reflection seismology to the solution of geologic problems. Send resumes to: Dr. D. R. Wones, Department of Geological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0796.

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Instrumental Analyst/Staff Research Associate III. Job # 81-08-23. Oversees computer-automated wave-length dispersive XRF spectrometer. Minimum qualifications: two years analytical experience or equivalent academic background, preferably but not necessarily with XRF or NOVA computer. Duties include: maintenance and repair of equipment; software development; and FORTRAN on-line mini-computer; participation in design and execution of strategies for analyzing trace metals in geological materials; and instruction of users. After first year, opportunity exists for personal research as time permits. Applicants should list equipment and applications with which they are experienced, and responsibilities therein. Salary \$1755/month and responsibilities therein. Send resume to: Santa Cruz, CA 95064 no later than November 1, 1981.

Faculty Positions Space Physics and Astronomy Rice University

The Department of Space Physics and Astronomy of Rice University has two regular faculty openings, beginning in academic year 1982-83.

For one position, which is at the professional level, preference will be given to experimentalists who are Principal Investigators for experiments on present or planned spacecraft missions. However, consideration will be given to other qualified candidates in the general areas of space physics and atmospheric science.

For the other position, which is at the assistant professor level, preference will be given to candidates with experience in space astronomy, although applications are solicited from specialists in any area of modern astrophysical research. It is also desirable, though not essential, that the candidate's research interests complement one or more areas of present astronomical research at Rice, such as planetary studies, stellar evolution and nucleosynthesis, gaseous nebulae, imaging and spectroscopy of galaxies, and computer image processing.

Applicants should send resumes and bibliographies to:
Professor A. J. Dessler
Chairman
Department of Space
Physics and Astronomy
Rice University
P.O. Box 1892
Houston, Texas 77001

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Petrologist-Economic Mineralogist/University of Oklahoma. Applications are invited for a tenure-track position, effective September 1, 1982 at the assistant professor level, in petrology and economic mineralogy. The successful applicant is expected to teach graduate courses in higher specialty, to help teach undergraduate courses in mineralogy-optical-petrography, and to pursue an active research program. Consulting and interacting with mining companies are encouraged.

The University of Oklahoma has made a major commitment to diversify the program in the School of Geology & Geophysics. As a result five tenure-track positions are open for the fall of 1982. Six new faculty were added to the School in the fall of 1981 (bringing the total full-time faculty to 15), and an additional six positions will be available during 1983-1985. A new building that will house the School is in the design stage, and the successful applicant will participate in equipping it.

The Ph.D. degree is required for this position. Preference will be given to petrologists with a strong chemistry background and with a demonstrated interest in the economic geology of metallic and non-metallic mineral deposits. Qualified applicants should arrange to send transcripts of all college and university work, resume, statement of research interests, and three letters of reference to: Dr. Maryellen Cameron, School of Geology and Geophysics, University of Oklahoma, Norman, Oklahoma, 73019. Deadline for applications is December 31, 1981. Faculty members from the School will be interviewing the nominees at a U.S.A. meeting in Cincinnati, Ohio, and at the December A.G.U. meeting in San Francisco, California.

The University of Oklahoma does not discriminate on the basis of race, or sex, and is an equal opportunity employer.

Purdue University. The Department of Geosciences invites applications for a faculty position, starting January or July 1982, in the broad field of mineralogy-petrology-geochemistry. A Ph.D. is required and preference may be given to scientists with an established record of research. The Department has an automated electron microprobe, mass spectrometer and laboratory for stable isotope studies, full range of high temperature and high pressure equipment, including furnaces for controlled ^{18}O experiments, as well as X-ray equipment. The successful applicant will be expected to participate in both the undergraduate teaching and graduate studies programs, as well as actively engage in research. Rank and salary are open but will be commensurate with qualifications.

Purdue University is a land grant, state supported institution committed to academic excellence, and is an equal opportunity/affirmative action employer. For further information please contact Dr. Henry O. A. Meyer, Dept. of Geosciences, Purdue University, West Lafayette, IN 47907 (Tel. 317-494-3271). Closing date for applications is November 10, 1981.

Postgraduate Research Assistant in Seismology at the Scripps Institution of Oceanography. Applicants for a postgraduate research position in seismology will be considered in all areas of seismology will be considered, although preference will be given to recent graduates interested in seismic wave propagation, particularly as applied to the oceanic environment and digital signal processing. The position has a duration of one year, with the possibility of extension to two years, and an annual stipend of \$18,960. Please send resume and three references to either Dr. Thomas H. Jordan or Dr. John Orcutt, A-015, Geological Research Division, Scripps Institution of Oceanography, La Jolla, CA 92093, prior to 1 December 1981.

Faculty Positions: The University of Iowa. The Department of Physics and Astronomy anticipates one or two openings for tenure-track faculty in August 1982. One or more visiting professorships, at any rank, are also expected to be available. Preference will be given to candidates with research activity in the following experimental and theoretical areas: astronomy, astrophysics, atomic physics, condensed matter physics, elementary particle physics, nuclear physics, plasma physics, and space physics. The positions involve undergraduate and graduate teaching, guidance of research students, and personal research. Interested persons should send a resume, a statement of research interests, and the names of three professional references to Search Committee, Department of Physics and Astronomy, The University of Iowa, Iowa City, IA 52242.

The University of Iowa is an equal opportunity/affirmative action employer.

Atmospheric Scientist/Oceanographer Position: The Joint Institute for the Study of the Atmosphere and Ocean, University of Washington. Atmospheric scientist/oceanographer needed to undertake analyses of interannual and interdecadal climate-related fluctuations in the ocean and atmosphere as revealed by marine surface observations from ships of opportunity and island stations.

Applicants should show evidence of published work on related topics and be adept at eliciting dynamical properties from the analysis of large data sets. The position is offered through the Joint Institute for the Study of the Atmosphere and Ocean, a cooperative research institute between the University of Washington and the National Oceanic and Atmospheric Administration. The work will be carried out in conjunction with scientists at the University and at the NOAA Pacific Marine Environmental Laboratory, which is housed on the University campus. Appointment is for one year, with a possibility of renewal for subsequent years up to a three-year term. Salary is negotiable, depending on qualifications and experience.

To apply or request further information, write to Director, J.I.S.A.O., Department of Atmospheric Sciences, Box 40, University of Washington, Seattle, WA 98195 U.S.A. Applications should include resume, bibliography, and two letters of recommendation. Closing date November 15, 1981. An equal opportunity/affirmative action employer.

The Caswell Silver Distinguished Professorship in Geology THE UNIVERSITY OF NEW MEXICO

The Department of Geology of the University of New Mexico is pleased to invite nominations or applications for the Caswell Silver Distinguished Professorship in Geology. This endowed professorship shall be awarded for periods of up to two years to earth scientists of distinguished accomplishment and international reputation. The professorship may be held by scientists of all specialties of the earth sciences in the broadest sense, and the major criterion for selection is that the individual be an active, productive leader in his or her field of research. The recipient must carry out a vigorous research program while in residence at UNM. The recipient is expected to interact with the faculty and students of the Department and to provide one or more seminars. In an advanced topic of higher choice, during each academic year. The Foundation will provide unusually advantageous remuneration commensurate with the distinguished nature of the appointment. In addition, a generous allocation for travel and operating expenses (to include secretarial support, analytical services in department laboratories, use of field vehicles, and preparation of manuscripts) will be provided.

Applications or nominations should include a detailed resume and brief statement of major research accomplishments. Applications or nominations should be forwarded to:

Rodney C. Ewing, Chairman
Department of Geology
University of New Mexico
Albuquerque, New Mexico 87131



The deadline for applications is January 1, 1982.

The Caswell Silver Foundation is an equal opportunity employer.

Geophysical Fluid Dynamics/Physical Oceanography. Applications are solicited for a junior faculty position in ocean physics or dynamics to begin in the academic year 1982-83. Areas of interest to the Department include analytical, numerical and laboratory modeling of physical processes and phenomena in the sea.

Yale University is an equal opportunity/affirmative action employer and encourages women and members of minority groups to compete for this position. Curriculum vitae, publications, and the names of three or more referees should be sent by 31 December 1981 to: Robert B. Gordon, Chairman, Department of Geology and Geophysics, P.O. Box 6666, New Haven, CT 06511.

Quaternary Sedimentation and Tectonics or Geophysics. The Geology Department at Miami University invites applicants for a position in either the field of Quaternary sedimentation (including glacial deposits) and tectonics or the field of geophysics. This position is to be filled at the Assistant Professor level beginning in August, 1982. The successful candidate will teach both undergraduate and graduate courses, must possess the Ph.D. degree and have documented ongoing research to be considered for the tenure track position.

Quaternary Sedimentation and Tectonics. Ideally applicants should have research and teaching interests in: (1) basin development and recent tectonics; (2) Quaternary sediment transport and depositional processes including till deposition; and (3) geomorphology.

Geophysics. Applicants should have research and teaching interests in: (1) relations between crustal structure and basin and continental margin evolution; or (2) general geophysics to include areas from among seismology, geomagnetism, gravity, electrical or heat-flow studies.

Visiting Assistant Professorship in Geology. The Department also invites applicants for a visiting assistant professor position beginning in August 1982. The position is of 1 to 3 year duration and is non-tenure track. The successful candidate must have the Ph.D. and will be responsible for teaching introductory-level courses as well as research and study in the person's area of research interest. This area is unspecified. The successful applicant will be chosen on the basis of qualifications and ability to interact with researchers currently on the staff.

Applicants should send a resume, transcripts, three (3) letters of reference and an outline of

teaching and research interests to: Dr. A. Dwight Baldwin, Jr., Chair, Geology Department, Miami University, Oxford, Ohio 45056.

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City University of New York, (Brooklyn College): Faculty Positions. The Department of Geology anticipates filling several tenure track positions at Full Professor level. (Salary range up to \$43,400). Highly qualified individuals will be considered for distinguished appointments at an additional \$5,000.

While candidates who have distinguished themselves in any field are welcome to contact us, we are particularly interested in openings in: energy resources (coal/petroleum), exploration geophysics, environmental geology or hydrogeology, coastal sedimentology, economic geology.

Successful applicants will be required to institute an active research program, supervise Master's and Ph.D. theses. Nominations and applications with current vitae should be sent to: Dr. S. Bhatnagar, Chairman, Dept. of Geology, Brooklyn College of City University of New York, Brooklyn, New York 11210. Positions open until filled.

Brooklyn College, CUNY, is an affirmative action/equal opportunity employer.

Faculty Positions. Arizona State University, Department of Geology. Applications are invited for two tenure-track faculty positions, one at the assistant professor level and one at the associate level, beginning in August of 1982. One of these positions requires a candidate with interests in applying modern solid state science to geological phenomena. The selected candidate should develop an active research program and may use the extensive opportunities offered by the Facility for High Resolution Electron Microscopy at ASU. Teaching duties will include undergraduate mineralogy. Candidates for the other position should complement and extend existing strengths in the department. Possible areas include low temperature geochemistry, heavy isotope geochemistry, solid earth geophysics, tectonophysics, and related fields. The ability to use modern techniques in both field and laboratory studies and to integrate diverse approaches is highly desirable. Please send a detailed statement of research and teaching interests and a resume with names of four references to David Kinney, Department of Geology, Arizona State University, Tempe, AZ 85287, by January 15, 1982.

Arizona State University is an equal opportunity/affirmative action employer.

Geophysics

University of Colorado

The Department of Physics, University of Colorado at Boulder, and the Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado/NOAA are currently recruiting for a tenure track faculty member, in the Department of Physics, with simultaneous appointment as a Fellow of CIRES, who will complement the Department's active role in the University's interdepartmental Graduate Program in Geophysics. We are particularly (but not exclusively) seeking persons with experience and interest in the areas of space geodesy, geodynamics, or related areas of theoretical geophysics.

Appointment will be at the level of assistant professor (minimum salary: \$20,000 per academic year) and is expected to start in the fall of 1982. The appointment entails full participation in the Department's undergraduate and graduate teaching programs (including offerings in the appointee's specialty), supervision of graduate students in appropriate areas, and the development of an active research program.

Candidates should send a letter of interest, a current curriculum vitae, and have three letters of reference sent no later than 1 January 1982 to:

Chairman
Department of Physics
Campus Box 390
University of Colorado
Boulder, Colorado 80309.

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STUDENT OPPORTUNITIES

Graduate Research Assistantships in Physical Oceanography. Opportunities for graduate students in M.S. or Ph.D. programs. A summer program with stipend is open to college juniors. Write: Douglas Caldwell, School of Oceanography, Oregon State University, Corvallis, OR 97331.

Earth Sciences Assistantships and Fellowships. Research assistantships and fellowships are available to graduate students in the earth sciences from the Columbia University Department of Geological Sciences. The awards cover tuition and fees, and provide a yearly stipend of between \$6400 and \$8180.

Research is carried out at affiliated institutions including the Lamont-Doherty Geological Observatory, the Goddard Institute for Space Studies, and the American Museum of Natural History. Research topics available to students reflect the interests of the more than 300 Ph.D.-level scientists at these institutions and span virtually every area of the earth sciences.

The department encourages applications from students with an undergraduate degree in any of the natural sciences or engineering. For additional information please contact Ms. Mia Leo, Department of Geological Sciences, Columbia University, Lamont-Doherty Geological Observatory, Palisades, New York, 10964.

Graduate Teaching & Research Assistantships/University of Houston. Graduate teaching & research assistantships available to qualified persons interested in Space Physics at the University of Houston. Our experimental program features rocket & balloon-borne studies of the ionosphere & magnetosphere-ionosphere coupling. Emphasis has been on active experiments, most recent being a rocket-balloon campaign at Siple, Antarctica in December 1980. Future work includes a study of pulsating aurora & participation in Waterhole II, an auroral quenching experiment. The theoretical program is on plasma waves in the solar wind & modeling of phenomena related to current experiments. Assistantships for first year students begin at \$600/mo along with out of state tuition waivers. Graduate Chairman, Physics Dept., University of Houston Central Campus, Houston, TX 77004. EOE

COURSES

Course No. 450: Clouds: Their Formation, Properties and Effects, Pasadena, CA, NOV 30-DEC 4, 1981. The course is designed to provide a basic understanding of the concepts and an overview of the dynamical and micro-physical processes involved in the formation of all pollution. The results of recent studies of clouds on other planets will also be discussed. The course is especially structured to benefit those scientists whose main area of expertise is not in clouds but who wish to be brought abreast of current studies in this subject. Instructors will be Dr. P. Hobbs, C. Leovy, H. D. Orville, B. Scott, T. Vonder Haar, and E. J. Zipser. Registration fee is \$590. A Certificate of Course Completion will be awarded to those who complete the course. For further information contact Diana McQuestion, Course Coordinator, IFAORS, P.O. Box P, Hampton, Virginia 23666 (Tel: 804/827-5811).

Nominations for Medals and Awards

William Bowie Medal. Awarded for outstanding contributions to fundamental geophysics and for unselfish cooperation in research.

Maurice Ewing Medal. Honors an individual who has led the way in understanding the physical, geophysical, and geological processes in the ocean; ocean engineering, technology, and instrumentation; or who has given distinguished service to the marine sciences.

James B. Macelwane Awards. Up to three awards are presented each year for significant contributions to the geophysical sciences by a young scientist of outstanding ability. Recipients must be less than 36 years old.

Robert E. Horton Medal. Awarded for outstanding contributions to the geophysical aspects of hydrology.

Letters of nomination outlining significant contributions and curriculum vitae should be sent directly to the appropriate committee chairman: **Bowie Medal**—George D. Garland, Department of Geophysics, University of Toronto, Toronto 5, Ontario, Canada. **Ewing Medal**—Robert O. Reid, Department of Oceanography, Texas A & M University, College Station, TX 77843; **Macelwane Award**—Manik Talwani, Lamont-Doherty Geological Observatory, Palisades, NY 10964; **Horton Medal**—Peter S. Eagleson, Department of Civil Engineering, Building 48-335, Massachusetts Institute of Technology, Cambridge, MA 03139.

**DEADLINE FOR NOMINATIONS IS
DECEMBER 15, 1981**

AGU

VGP News

A new journal, *Volcanology and Seismology*, is now being published by the U.S.S.R. Academy of Sciences. S. A. Fedotov is the editor. AGU was approached as a possible publisher of a selected English translation of the journal, which was to be sold by subscription. There was not enough interest to proceed, and the translation rights are no longer available to AGU. To serve the needs of the section better, please let us know what Soviet journals should be considered for translation. Please notify Joseph V. Smith, Department of Geophysics and Science, University of Chicago, Chicago, IL 60637 (telephone: 312-753-8110). In particular, please state whether your library would buy translations.

Andrew F. Nagy (Department of Atmosphere and Ocean Sciences, 2455 Hayward, University of Michigan, Ann Arbor, MI 48109 (telephone: 313-763-5536) is soliciting review articles for *Reviews of Geophysics and Space Physics*. VGP members are urged to contact Nagy if they have ideas for suitable papers.

VGP members who attend the AGU Fall Meeting in San Francisco will want to attend the Joint Planetary VGP luncheon on Thursday, December 10, at the Nikko Restaurant. The luncheon in Baltimore was very enjoyable, and this one will feature the added attraction of providing the opportunity to meet informally with members of the section of Planetary.

Brent Dalrymple
Secretary, VGP

Hydrology Prepares to Select Fellows

According to the recent AGU Council ruling, the Hydrology Section's Fellows Nominating Committee soon will select three hydrologists from those nominated by section members for the honor of AGU Fellow. The names of the three selected will be forwarded to the chairman of the AGU Fellows Committee for their annual selection of approximately 11 Fellows.

The Hydrology Section's committee is composed of Leonard F. Konikow, Ignacio Rodriguez-Iturbe, Mark F. Meier, and Jaime Amorocho. Peter Eagleson, section president-elect, serves as committee chairman; Jim Wallis, president of the Hydrology Section, is an ex-officio committee member.

Travel Grants to IAG General Meeting

Deadline for Applications: January 1, 1982

AGU has applied to the National Science Foundation for a grant to assist the travel of individual U.S. scientists to the General Meeting of the International Association of Geodesy, to be held in Tokyo, Japan, May 7-20, 1982. Application forms for the grants are available from Member Programs Division, American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20007 (telephone 202-462-6903 or toll free 800-424-2488).

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS CONFERENCE ON MATHEMATICAL AND COMPUTATIONAL METHODS IN THE EXPLORATION AND EXTRACTION OF DEEP MINERAL RESOURCES

November 16-19, 1981

Tucson Marriott
Tucson, Arizona

Invited speakers:

Peter Annon, Golder Associates
Robert W. Bartlett, Anaconda Copper Company
Norman I. Bleistein, Department of Mathematics, University of Denver
Alberto P. Calderon, Department of Mathematics, University of Chicago
Michel David, Mineral Exploration Research Institute
James G. Glimm, Department of Mathematics, Rockefeller University
Philip Grote, Science Applications, Inc.
Gerald W. Hohmann, Department of Geology and Physics, University of Utah

Advance Registration

To obtain a copy of the program, advance registration material and hotel reservation card, contact SIAM, 117 South 17th Street, Philadelphia, PA 19103. Telephone: (215) 564-2929.

A conference and workshop structured specifically to foster the exchange of ideas and techniques between applied mathematicians, geophysicists and others concerned with the technical problems of exploration and extraction of deep mineral resources.

- Formal presentations on the problems and solution approaches, with the focus on where the methods work . . . and where they don't.
- Workshops on electromagnetic and seismic methodologies, where participants will have the opportunity to discuss their problems and their research.
- Poster presentations that provide the opportunity for participants to discuss specific progress being made by researchers, and contributed papers by other researchers in the fields being addressed.

Here is a conference that provides time for participants to engage in informal discussions about their work. The program committee will encourage the organization of some informal workshops involving speakers and registrants, in addition to those formally scheduled.

Jim Koslos, International Submarine Technology, Ltd.
Kenneth L. Lamer, Western Geophysical Co.
Thomas R. LaFehr, Exploration Data Consultants Incorporated
Richard B. McCammon, United States Department of the Interior
K. G. McCracken, Institute of Earth Resources
Mitsuo N. Nabighian, Newmont Exploration Limited
Enders A. Robinson, Department of Geological Sciences, Cornell University
Robert H. Stoll, Conoco, Inc.
Ted Way, In-situ Consulting, Inc.

The symposia for this conference is being supported by the National Science Foundation.

Meetings

Remote Sensing Symposium

A call for papers has been issued for the symposium on Remote Sensing and Mineral Exploration, scheduled for May 17-22, 1982, in Ottawa, Ont. The symposium will include a session on the use of geophysical data with remotely sensed imagery in the exploration of petroleum and mineral deposits and groundwater. Emphasis during the session will be on global terrestrial data sets, geophysical satellite systems and data, manual and digital synthesis of spaceborne remotely sensed imagery with geophysical data in geological exploration, and case histories. Session chairman is David A. Hastings at the Applications Branch of the EROS Data Center, Sioux Falls, SD 57198 (telephone: 605/594-6114).

Other sessions on the agenda include spectral measurements of rocks and alteration zones; temporal aspects of mineral resources discovery; continental and global models; North American Plate mosaic and lineament map; and future plans for research and information exchange.

Deadline for submission of abstracts to the symposium chairman is January 15. For additional information, contact W. D. Carter, Symposium Chairman, EROS Office, U.S. Geological Survey, MS 730, Reston, VA 22092.

The symposium is sponsored by the Committee on Space Research (COSPAR) of the International Committee of Scientific Unions, the International Union of Geological Sciences, the Association of Geoscientists for International Development, and the International Association of the Geologists of Ore Deposits.

Symposium on Urban Groundwater

A half-day symposium on groundwater in the urban environment will be held as part of the American Geophysical Union's Spring Meeting in Philadelphia on May 31 to June 4, 1982. The symposium is cosponsored by the Groundwater Committee and the Urban Hydrology Committee.

In recent years, much attention has been lavished on surface water in the urban environment, but very little has been published on groundwater considerations specific to urban areas or on the effects of urbanization on groundwater quantity and chemistry. The purpose of this symposium is to highlight current work in this area. Papers are now being solicited for inclusion in the symposium. Topics include, but are not restricted to, the following general areas: methods and effects of dewatering; alterations in groundwater chemistry as a result of waste disposal, spills, and leaks; effects of urbanization on natural groundwater recharge and discharge; and flooding of foundations as a result of rising water levels. The symposium will focus on case studies and applications of models.

Abstracts should be prepared according to AGU format and mailed before February 15, to Mary P. Anderson, Dept. of Geology and Geophysics, University of Wisconsin, 1215 W. Dayton St., Madison, WI 53706. In addition, the abstract original must be sent to Meetings, AGU, 2000 Florida Ave., N.W., Washington, D. C. 20009 by the Spring Meeting abstract deadline in early March. Additional information can be obtained by calling Anderson (608-262-2396) or J. W. Delleur (317-494-2712).

Exploration Geophysics

AGU Geophysical Methods for Acoustic Reflection

AGU Geophysical Methods for Acoustic Reflection is a new AGU publication. It is a collection of papers from the AGU Geophysical Methods for Acoustic Reflection Symposium, held in 1980.

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New Techniques to Probe Atmosphere

A symposium entitled 'Radio Probing of the High-Latitude Ionosphere and Atmosphere: New Techniques and New Results' will be held at the Geophysical Institute at the University of Alaska in Fairbanks on August 9-13, 1982. The symposium is sponsored by Commission G of the International Union of Radio Science (IUR). Robert D. Hunsucker is the steering committee chairman.

Scientists interested in submitting papers for presentation at the symposium should contact the technical program committee chairman, Ray A. Greenwald, The Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Road, Laurel, MD 20707. Information on conference registration can be obtained from the conference coordinator, Patricia Brooks, Geophysical Institute, University of Alaska, 903 Koyukuk Avenue North, Fairbanks, AK 99701. The meeting is limited to 100 participants.

Superior Geology

The 28th Annual Meeting of the Institute on Lake Superior or Geology will be held in International Falls, Minn., May 5-8, 1982.

The focus of the meeting will be on Archean geology of the Minnesota-Ontario border area. One-day field trips to Archean areas near International Falls and Fort Frances, Ont., are planned for May 5 and 6. Technical sessions are scheduled for May 6 and 7.

For additional information, contact David L. Southwick, Minnesota Geological Survey, 1633 Euclid St., St. Paul, MN 55108 (telephone: 612-273-3372).

AGU Congressional Science Fellowship

The individual selected will spend a year on the staff of a congressional committee or a House or Senate member, advising on a wide range of scientific issues as they pertain to public policy questions.

Prospective applicants should have a broad background in science, be articulate, literate, flexible, and able to work well with people from diverse professional backgrounds. Prior experience in public policy is not necessary, although such experience and/or a demonstrable interest in applying science to the solution of public problems is desirable.

The fellowship carries with it a stipend of up to \$25,000 plus travel allowances.

Interested candidates should submit a letter of intent, a curriculum vitae, and three letters of recommendation to AGU. For further details, write Member Programs Division, Congressional Fellowship Program, American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20009.

Deadline: March 31, 1982.

AGU CHAPMAN CONFERENCE

RAINFALL RATES

April 27-29, 1982 Urbana, Illinois

Convenor: D. M. Hershfield

Sessions planned:

Atmospheric physics as related to rainfall process.

Measurement: mass (tipping bucket), photoelectric, magnetic, and remote methods.

Models: physical, mathematical, and statistical.

Applications: point, area, quasi-horizontal path, surface, troposphere, and stratosphere.

Call for papers published in EOS, July 14. Abstract deadline: December 21, 1981.

The complete Geophysical Year last appeared in the August 25 EOS.

Boldface type indicates meetings sponsored or cosponsored by AGU.

Changes

1982

August 23-27 Ninth Annual Meeting of the European Geophysical Society, previous listing of date of meeting was incorrect. Additionally, it should be noted that this meeting is run in conjunction with the 18th General Assembly of the European Seismological Commission.

New Listings

1982

January 26-29 Fourth Annual Conference on the NASA Geodynamics Program, Greenbelt, Md. (P. T. Taylor, Code 922, NASA/Goddard Space Flight Center, Greenbelt, MD 20771).

June 20-25 63rd Annual Meeting of the American Association for the Advancement of Science, Pacific Division, Santa Barbara, Calif. Sponsors, American Meteorological Society, Atmospheric and Hydrospheric Sciences Section of AAAS, Pacific Division. (A. E. Leviton, Executive Director, AAAS (Pacific Division), California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118).

August 28-31 Alfred-Wegener-Conference on Geophysical, Geochronological and Petrological Evidence on Deformation and Composition of the Continental Subcrustal Lithosphere, Garmisch, Federal Republic of Germany. (K. Fuchs, Geophysical Institute University, Hertzstr. 16, D-7600 Karlsruhe, Federal Republic of Germany).

AGU Seismic Methods

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3735 Interaction of atmosphere with electromagnetic waves

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Geomagnetism and Aeronomy

Volume 20, Number 5

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most common are (110) and (100). The (110) is 3.5, (100) is 1.5, (111) is 1.5, (112) is 1.5, (113) is 1.5, (114) is 1.5, (115) is 1.5, (116) is 1.5, (117) is 1.5, (118) is 1.5, (119) is 1.5, (120) is 1.5, (121) is 1.5, (122) is 1.5, (123) is 1.5, (124) is 1.5, (125) is 1.5, (126) is 1.5, (127) is 1.5, (128) is 1.5, (129) is 1.5, (130) is 1.5, (131) is 1.5, (132) is 1.5, (133) is 1.5, (134) is 1.5, (135) is 1.5, (136) is 1.5, (137) is 1.5, (138) is 1.5, (139) is 1.5, (140) is 1.5, (141) is 1.5, (142) is 1.5, (143) is 1.5, (144) is 1.5, (145) is 1.5, (146) is 1.5, (147) is 1.5, (148) is 1.5, (149) is 1.5, (150) is 1.5, (151) is 1.5, (152) is 1.5, (153) is 1.5, (154) is 1.5, (155) is 1.5, (156) is 1.5, (157) is 1.5, (158) is 1.5, (159) is 1.5, (160) is 1.5, (161) is 1.5, (162) is 1.5, (163) is 1.5, (164) is 1.5, (165) is 1.5, (166) is 1.5, (167) is 1.5, (168) is 1.5, (169) is 1.5, (170) is 1.5, (171) is 1.5, (172) is 1.5, (173) is 1.5, (174) is 1.5, (175) is 1.5, (176) is 1.5, (177) is 1.5, (178) is 1.5, (179) is 1.5, (180) is 1.5, (181) is 1.5, (182) is 1.5, (183) is 1.5, (184) is 1.5, (185) is 1.5, (186) is 1.5, (187) is 1.5, (188) is 1.5, (189) is 1.5, (190) is 1.5, (191) is 1.5, (192) is 1.5, (193) is 1.5, (194) is 1.5, (195) is 1.5, (196) is 1.5, (197) is 1.5, (198) is 1.5, (199) is 1.5, (200) is 1.5, (201) is 1.5, (202) is 1.5, (203) is 1.5, (204) is 1.5, (205) is 1.5, (206) is 1.5, (207) is 1.5, (208) is 1.5, (209) is 1.5, (210) is 1.5, (211) is 1.5, (212) is 1.5, (213) is 1.5, (214) is 1.5, (215) is 1.5, (216) is 1.5, (217) is 1.5, (218) is 1.5, (219) is 1.5, (220) is 1.5, (221) is 1.5, (222) is 1.5, (223) is 1.5, (224) is 1.5, (225) is 1.5, (226) is 1.5, (227) is 1.5, (228) is 1.5, (229) is 1.5, (230) is 1.5, (231) is 1.5, (232) is 1.5, (233) is 1.5, (234) is 1.5, (235) is 1.5, (236) is 1.5, (237) is 1.5, (238) is 1.5, (239) is 1.5, (240) is 1.5, (241) is 1.5, (242) is 1.5, (243) is 1.5, (244) is 1.5, (245) is 1.5, (246) is 1.5, (247) is 1.5, (248) is 1.5, (249) is 1.5, (250) is 1.5, (251) is 1.5, (252) is 1.5, (253) is 1.5, (254) is 1.5, (255) is 1.5, (256) is 1.5, (257) is 1.5, (258) is 1.5, (259) is 1.5, (260) is 1.5, (261) is 1.5, (262) is 1.5, (263) is 1.5, (264) is 1.5, (265) is 1.5, (266) is 1.5, (267) is 1.5, (268) is 1.5, (269) is 1.5, (270) is 1.5, (271) is 1.5, (272) is 1.5, (273) is 1.5, (274) is 1.5, (275) is 1.5, (276) is 1.5, (277) is 1.5, (278) is 1.5, (279) is 1.5, (280) is 1.5, (281) is 1.5, (282) is 1.5, (283) is 1.5, (284) is 1.5, (285) is 1.5, (286) is 1.5, (287) is 1.5, (288) is 1.5, (289) is 1.5, (290) is 1.5, (291) is 1.5, (292) is 1.5, (293) is 1.5, (294) is 1.5, (295) is 1.5